

IN THE CLAIMS:

Please replace all previously pending claims with the listing of claims set forth below:

1. (Currently Amended) Method for treatment of black liquor at a pulp mill in order to recover its contents of chemicals and energy, comprising the following steps:

passing a black liquor flow (10) from an evaporation plant to a pyrolysis reactor (1),

pyrolysing the black liquor in the pyrolysis reactor at a temperature of 300-800°C in the absence of an external gas component in order to separate evaporable compounds (12) from coke (11) remaining in a solid state, the evaporable compounds containing vaporized water,

recovering the evaporable compounds (12) from the pyrolysis reactor,

passing the coke (11) from the pyrolysis reactor to a gasification reactor (3) for gasification,

gasifying the coke in the gasification reactor under such conditions that sulphur compounds contained in the coke (11) and deriving from the cooking chemicals are reduced to sodium sulphide, and

recovering product gases generated by gasification in the gasification reactor.

2. (Previously Presented) Method according to claim 1, wherein only a part of the black liquor flow (10) arriving from the evaporation plant is taken to the pyrolysis reactor (1), whereas a second part of the black liquor flow (10) is taken to a soda recovery boiler (3) where it is burnt in order to recover its contents of chemicals and energy.

3. (Previously Presented) Method according to claim 1, wherein the evaporable compounds (12) separated from the black liquor in the pyrolysis reactor (1) are used at the mill as fuel in part or entirely.

4. (Previously Presented) Method according to claim 1, wherein the evaporable compounds (12) separated from the black liquor in the pyrolysis reactor (1) are processed further.

5. (Previously Presented) Method according to claim 1, wherein product gases (14) resulting from the gasification are used at the mill as fuel in part or entirely.

6. (Cancelled)

7. (Previously Presented) Method according to claim 1, wherein the pyrolysis reactor (1) is for a batch process, whereby increasing of the temperature may begin from the temperature of the black liquor arriving in the reactor, while the final temperature is chosen according to the desired final products.

8. (Previously Presented) Method according to claim 1, wherein the pyrolysis reactor (1) is for a continuous process.

9. (Previously Presented) Method according to claim 1, wherein the pyrolysis is carried out in such process conditions (temperature, pressure, residence time, heating speed, etc.), wherein the evaporable compounds (12) mainly consist of non-condensing gases.

10. (Previously Presented) Method according to claim 1, wherein the pyrolysis is carried out in such process conditions (temperature, pressure, residence time, heating speed, etc.), wherein the evaporable compounds (12) mainly consist of pyrolysis oil.

11. (New) Method according to Claim 1, wherein the pyrolysis in the pyrolysis reactor is carried out at a temperature of 550-650°C.